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BEYOND THE DOOR IS AN UNKNOWN PLANET

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ABSTRACT: This article discusses a special device capable of reproducing the environmental conditions of other planets. This planetary stimulator, called "Photostat-1" is essentially a pressure chamber capable of modeling the atmospheric composition, pressure, and the daily variations of Mars and other planets. This facility is the first which is capable of stimulating the UV radiation on other planets. Special lighting fixtures can imitate the entire solar spectrum, including a wide range of UV rays and individual lines of the solar spectrum. Experiments with the "Photostat" indicate that various living creatures may be able to survive in a wide range of alien conditions.

In the Soviet Union an automatic device has been developed which simulates the environment of other planets.

We open this door and enter. The room is empty. In the darkness above the multicolored indicators the warning inscription burns with a steady light, "device on." It is quiet. Then a series of sharp, metallic clicks is heard -- the relays. The professor takes hold of a long, nickel-plated handle on a small door built into the wall and pulls it toward himself. The door which seemed thin and fragile one minute ago opened easily and has become similar to the door on a huge bank vault. We looked inside. "Here it is, our new device," announced the professor.

This device was built so that the strange world, which people who fly to other planets will soon set foot upon, could be studied, without leaving the laboratory. In principle, this apparatus may simulate the environments of planets, whose physical conditions are in close resemblance to those of the Earth.

The device, built in the laboratory of one of the Leningrad Institutes has been named "Photostat-1." It is controlled by a programmed computer.

The main part of the equipment consists of the vacuum chamber. It is here that the climate of the alien planet is simulated. Behind the glass of the chamber, the diurnal temperature rhythm is found, particularly that of Mars with its specific fluctuations: by day 25 to 30°C, by night -20 to -25°C. Of course, as the poles are approached, this temperature becomes even lower. After all, the Martian atmosphere is 10 times less dense than the atmosphere of the Earth, and is therefore easily penetrated by heat (thermal) rays. The programming of the "Photostat" observes this rigorous and strict temperature rhythm.

"On the background of diurnal temperature fluctuation," says Professor L. K. Lozina-Lozinskii, Chairman of the Laboratory of Space Biology, and originator of the ideas on which the creation of the "Photostat" was based, "we also simulate the gaseous environment of other planets, i.e., the atmospheric composition. According to the latest scientific data, the atmospheric pressure on Mars, for example, is around seventy mm Hg. We have achieved such rarefaction in the "Photostat" and even greater rarefaction...."

Experiences of the past few years have shown that high rarefaction does not interfere with the life of many organisms. Here, it is true, an additional complication arises: when pressure is decreased, the quantity of oxygen is also decreased in the air of the alien planet. Therefore, it is natural to assume that those terrestrial creatures that are not susceptible to oxygen starvation are capable of living on such planets. There are any number of such creatures on Earth, such as infusoria, worms, and insects.

Inside, behind the thick door and glass barrier with round openings for the hands, stands the vacuum chamber. This is a plastic vessel (its volume is 18 liters), whose bottom is not just a bottom but the surface of a distant and, therefore, secret planet.

A cold draft has come out of the chamber to meet us. Professor Lozina-Lozinskii has closed the door to the unknown planet tightly.

"One of the chief advantages of our device," says the professor, "is the fact that the action of ultraviolet radiation on other planets may be studied on it. Until now this action has not been investigated anywhere.

Specially selected lamps imitate the entire solar spectrum, including the broad spectrum of ultraviolet rays. If desired, the scientist may leave only one of the spectral lines by temporarily blocking out all the others. This is necessary because the different lines of the ultraviolet spectrum can produce different effects. For example, one of the most powerful lines, according to biological action, is created by rays with the wavelength of 2.537 Å. These rays are always fatal if the exposure is sufficiently long. Here the professor takes a small, covered-glass dish out of the desk and opens it. Inside, on cotton, are some lazily crawling caterpillars. They are caterpillars of the European corn borer, and not long ago they had spent an entire 30 hours exposed to these very same "lethal" rays. As one sees, nothing has happened! They are alive and healthy. Similarly, many insects are capable of living even when exposed constantly to the action of these rays. And on many planets the rays do act constantly. True, some astronomers believe that not all ultraviolet rays reach the surface of the planets. Most probably the thin chitinous skin in which the insects are "dressed" was the factor responsible for protecting the corn borer from the lethal rays in our experiments.

In the laboratory of the Institute, even before the "Photostat" was built, very interesting data were obtained on the protective action of visible light. It appears that if a living cell is subjected to an unconditionally fatal dose of ultraviolet light and then placed in darkness, the cell will die. But is is

only necessary to illuminate the cell after irradiation and it remains alive." Visible light acts as if it were curing the cell. The mechanism of this phenomenon is still not clearly understood, although it may already be firmly stated that, under the action of light, some kind of complex biochemical processes take place which restore life to the cell.

These experiments have made it possible to assume that on some of the planets of the solar system there may be living creatures which are first killed and then "resurrected" by visible light.

"Of course, it may be" says the professor, "that many organisms on these planets lead a nocturnal life so as to avoid ultraviolet radiation."

One of the goals which the scientists have set for themselves is to test this hypothesis by means of the "Photostat." Incidentally, the "Photostat" is not used only for depicting the cosmic future. This device may also reproduce any kind of terrestrial climate -- the shivering frost of the Arctic and Antarctic, the heat and burning sun of the equator, and the moderate weather of the middle latitudes.

Now it is night on the artificial planet. This is evidenced by a small blue bulb. When the automatic computer has counted off the proper number of hours, the light will go out, and a yellow one under which the word "day" is inscribed will light up. The computers can also simulate twilight.

"Generally speaking," I ask the professor in parting, "would you care to comment on the question of whether there is life on Mars?"

"Could be," he smiles.

We go out and the unknown planet remains behind. The long, almost alive, needles of the flickering autographs write out fine lines on the ribbons. Little, unknown planet. Soon it will be morning there.

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